

**UNCLASSIFIED**

Exhibit R-2, PB 2010 Air Force RDT&E Budget Item Justification								DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)					R-1 ITEM NOMENCLATURE PE 0603789F C3I Advanced Development					
COST (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
Total Program Element	31.781	33.902	0.000						Continuing	Continuing
634072: Dominant Battlespace Awareness	5.784	7.946	0.000						Continuing	Continuing
634216: Battlespace Information Exchange	11.464	14.960	0.000						Continuing	Continuing
634872: Aerospace Information Dominance	14.533	10.996	0.000						Continuing	Continuing

Note

Note: In FY 2010 efforts in this PE move to PE 0603788F, Global Information Dev/Demo.

A. Mission Description and Budget Item Justification

This program develops and demonstrates Air Force Command, Control, Communications, and Intelligence (C3I) technologies for the warfighter. The technologies address the ability to support the global information exchange of correlated and fused information to ensure the Air Force can plan and execute missions in a dynamic, complex environment. The Dominant Battlespace Awareness project will provide affordable operational data capabilities for personnel to understand militarily relevant situations, on a consistent basis, with the precision and timeliness needed to accomplish the mission. The Battlespace Information Exchange project will develop reliable, secure, jam-resistant, inter-operable worldwide global information enterprise capabilities, providing the Air Force assured communications and reach-back capability in a distributed operational environment. It will also demonstrate offensive cyber operations technologies allowing attack and exploitation of adversary information systems by the Air Force. The Aerospace Information Dominance project provides the technology and demonstrations needed to allow the warfighter to plan, assess, execute, monitor, and re-plan on the compressed time scales required for tomorrow's conflicts, whether in combat or peacekeeping missions. This program is in Budget Activity 3, Advanced Technology Development, since it develops and demonstrates technologies for existing upgrades and/or new system developments that have military utility and address warfighter needs.

**UNCLASSIFIED**

R-1 Line Item #32

Page 1 of 19

**UNCLASSIFIED**

Exhibit R-2, PB 2010 Air Force RDT&E Budget Item Justification			DATE: May 2009	
APPROPRIATION/BUDGET ACTIVITY		R-1 ITEM NOMENCLATURE		
3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)		PE 0603789F C3I Advanced Development		
B. Program Change Summary (\$ in Millions)				
	FY 2008	FY 2009	FY 2010	FY 2011
Previous President's Budget	32.821	30.103	42.165	
Current BES/President's Budget	31.781	33.902	0.000	
Total Adjustments	-1.040	3.799	0.000	
Congressional Program Reductions	0.000	-0.008		
Congressional Rescissions	0.000	-0.093		
Total Congressional Increases	0.000	3.900		
Total Reprogrammings	-0.320	0.000		
SBIR/STTR Transfer	-0.720	0.000		
Change Summary Explanation				
Note: In FY 2009, Congress added \$3.9 million for Massively Parallel Optical Interconnects for Battlespace Information Exchange.				
C. Performance Metrics				
(U) Under Development.				

**UNCLASSIFIED**

R-1 Line Item #32

Page 2 of 19

# UNCLASSIFIED

Exhibit R-2a, PB 2010 Air Force RDT&E Project Justification								DATE: May 2009		
APPROPRIATION/BUDGET ACTIVITY 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)				R-1 ITEM NOMENCLATURE PE 0603789F C3I Advanced Development					PROJECT NUMBER 634072	
COST (\$ in Millions)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
634072: Dominant Battlespace Awareness	5.784	7.946	0.000						Continuing	Continuing
<b>Note</b> Note: In FY 2010 this effort moves to PE 0603788F, Project 5321, Global Battlespace Awareness.										
<b>A. Mission Description and Budget Item Justification</b> This project develops, integrates, and demonstrates advanced technologies to achieve Dominant Battlespace Awareness (DBA) and Predictive Battlespace Awareness (PBA) using information from all sources. DBA is the information required to support dynamic planning and execution with the accuracy, fidelity, and timeliness needed to dominate the battlespace. Technology development includes: tasking information collectors (intelligence, surveillance, and reconnaissance platforms, national intelligence sources, etc.); correlating and geo-registering the collected data; exploiting the data to extract information of military significance; fusing information from multiple sources to create a digital n-dimensional representation of the battlespace; assessing the situation; predicting adversary courses of action (COA); and archiving the results for ready use by decision makers. This is a dynamic, complex process that involves technologies for information access, extraction, fusion, processing, storage, and retrieval, as well as technologies for machine reasoning, pattern recognition, and timeline analysis.										
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>							FY 2008	FY 2009	FY 2010	FY 2011
MAJOR THRUST: Develop and demonstrate advanced signal and data exploitation technologies for detection, tracking, identification, and targeting of time-critical targets, and information extraction technologies for situational awareness.  In FY 2008: Developed a real-time Signal Processing and Geolocation capability for emerging commercial communications used by military and asymmetrical threats. Developed airborne-cued, ground-based signal processing and geolocation capability.  In FY 2009: Demonstrate a real-time signal processing and geolocation capability for emerging commercial communications used by military and asymmetrical threats. Demonstrate airborne-cued ground-based signal processing. Develop multi-sensor exploitation tools to enable characterization and assessment of adversary satellites. Integrate intelligence data and analysis products to produce anticipatory ground to space awareness picture.							1.904	2.172	0.000	

UNCLASSIFIED

R-1 Line Item #32

Page 3 of 19

**UNCLASSIFIED**

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
In FY 2010: Not Applicable.				
<p>MAJOR THRUST: Develop and demonstrate advanced data handling, event visualization technologies, and distributed data fusion to enable a more effective utilization of the vast amounts of data available to intelligence analysts to provide optimized situation awareness, as well as to support all phases of combat operations.</p> <p>In FY 2008: Continued software and algorithmic design and development efforts for determination of adversarial behavior within persistent surveillance data, contextual tracking, target-feature-aided tracking, multi-INT association and cross-cueing and geospatial reasoning and cued exploitation. Developed methods for combining post-event processing of intelligence data with real-time streaming intelligence data for indications and warning functions. Initiated the design and development of a synthetic assessment environment for the evaluation of the full range of fusion technologies to include basic correlation algorithms to higher levels of fusion algorithms tested in conjunction with command and control systems. Initiated investigation of Fusion of Cyber Intelligence (CYBINT) with traditional INTs.</p> <p>In FY 2009: Demonstrate software and algorithmic design and development efforts for determination of adversarial behavior within persistent surveillance data, contextual tracking, target-feature-aided tracking, multi-INT association and cross-cueing and geospatial reasoning and cued exploitation. Demonstrate methods for combining post-event processing of Intel data with real time streaming Intel data for indications and warning functions. Continue design and development of a synthetic assessment environment for the evaluation of the full range of fusion technologies to include basic correlation algorithms to higher levels of fusion algorithms tested in conjunction with C2 systems. Continue investigation of Fusion of CYBINT with traditional INTs. Develop the capability to extract events of interest form unstructured text in order to enable automated visualization of events on timelines and maps.</p> <p>In FY 2010: Not Applicable.</p>	3.880	5.774	0.000	

**UNCLASSIFIED**

R-1 Line Item #32

Page 4 of 19

# UNCLASSIFIED

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<b>C. Other Program Funding Summary (\$ in Millions)</b>										
	<b><u>FY 2008</u></b>	<b><u>FY 2009</u></b>	<b><u>FY 2010</u></b>	<b><u>FY 2011</u></b>	<b><u>FY 2012</u></b>	<b><u>FY 2013</u></b>	<b><u>FY 2014</u></b>	<b><u>FY 2015</u></b>	<b><u>Cost To Complete</u></b>	<b><u>Total Cost</u></b>
Activity Not Provided/ Related Activities:	0.000	0.000							Continuing	Continuing
PE 0602702F/ Command, Control, and Communications.	0.000	0.000							Continuing	Continuing
PE 0603203F/ Advanced Aerospace Sensors.	0.000	0.000							Continuing	Continuing
PE 0603742F/ Combat Identification Technology.	0.000	0.000							Continuing	Continuing
Activity Not Provided/ This project has been coordinated through the Reliance 21 process to harmonize efforts and eliminate	0.000	0.000							Continuing	Continuing
<b>D. Acquisition Strategy</b> Not Applicable.										
<b>E. Performance Metrics</b> Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.										

# UNCLASSIFIED

R-1 Line Item #32

Page 5 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>								<b>DATE:</b> May 2009		
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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
634216: Battlespace Information Exchange	11.464	14.960	0.000						Continuing	Continuing

**Note**

Note: In FY 2010 this effort moves to PE 0603788F, Project 5320, Assured Worldwide Connectivity.

**A. Mission Description and Budget Item Justification**

This project develops and demonstrates advanced communications technologies for the Air Force that implement a secure environment for worldwide information exchange of near-real-time multimedia (i.e., voice, data, video, and imagery) information. This secure environment will be rapidly deployable, mobile, interoperable, and seamless between Air and Space Operations Centers (AOC) and aircraft, either en-route or in theater. It will: a) provide interoperability across echelons, services, coalition, and multi-national force boundaries; b) support mobile information superiority, sensor-to-shooter operations, and the battle management decision process; and c) provide in-transit visibility of en route aircraft, cargo, mission status, and reachback capabilities for aircraft to operations centers in the Continental United States (e.g., updating information and mission changes to en route aircraft). Technology developments include an information assurance decision support system, advanced information management, multi-level/secure communications, secure survivable networks, mission and content-based routing, quality-of-service mechanisms, communications transmission systems, cyber situational awareness, and offensive cyber operations capabilities to attack and exploit adversary information and information systems.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<b>MAJOR THRUST:</b> Develop and demonstrate secure wideband assured networking between weapon platforms (e.g. munitions, uninhabited air systems, and aircraft), ground facilities and Special Operations Forces personnel.  In FY 2008: Completed development of a small form-factor prototype information networking capability for information sharing and collaboration with other networking assets (aircraft, uninhabited air systems, ground facilities).  In FY 2009: Develop small form-factor networking and reachback capability. Begin certification of the capability in preparation for transition to the Special Operations Forces.	0.903	1.134	0.000	

**UNCLASSIFIED**

R-1 Line Item #32

Page 6 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)	<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development			<b>PROJECT NUMBER</b> 634216	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>	
In FY 2010: Not Applicable.					
<p>MAJOR THRUST: Proactively defend cyberspace through cyber situational awareness, detecting and defeating cyber threats, and surviving through adaptation and self-regeneration. Note: This effort transitioned in FY 2008 from Applied Research PE 0602702F, Project 4519, into this PE.</p> <p>In FY 2008: Developed technology demonstration plans for a fleet of cooperative agents trusted to defend mission critical Air Force assets by gathering cyber situational awareness information for defensive decision making. Developed secure data sharing to prevent the disclosure of sensitive information to untrustworthy users.</p> <p>In FY 2009: Develop technology demonstration plans for active ISR defense on wired networks. Continue cyber situational awareness demonstration. Continue development of secure data sharing to prevent the disclosure of sensitive information to untrustworthy users.</p> <p>In FY 2010: Not Applicable.</p>	0.772	2.710	0.000		
<p>MAJOR THRUST: Design, develop, demonstrate, test, and validate an integrated tool suite for Modeling and Simulating the Air Force's extension of the Global Information Grid, the evolving Airborne Network. This thrust will provide the Air Force with the ability to accomplish both mission and technical analyses, at the appropriate levels of fidelity, to enable the effective migration of legacy systems for the development and evolution of the Airborne Network. Note: This effort completes in FY 2009, and does not transfer to PE 0603788F.</p> <p>In FY 2008: Tested and validated the modeling and simulation capability using real world scenarios to determine the accuracy and real-time nature of the capability. Established enhancements to the current modeling capability and to assess processing requirements.</p>	0.623	1.374	0.000		

**UNCLASSIFIED**

R-1 Line Item #32

Page 7 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009	
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)	<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development		<b>PROJECT NUMBER</b> 634216	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<p>In FY 2009: Continue the validation of the enhanced modeling and simulation capability and support tool suite and make it usable by an operational person instead of programmers. Exercise the limitations of the modeling capability and apply the model to proposed future DoD networking environments.</p> <p>In FY 2010: Not Applicable.</p>				
<p>MAJOR THRUST: Design, develop, and demonstrate the enterprise management capability to accept on-paper policy (e.g., word documents, or other Air Tasking Orders, etc.) and translate that format into network policy language to provide this "policy meta-data" to a network enterprise system in executable form in order to re-configure, re-constitute, and strengthen Air Force networks in response to strategic, tactical, and network events (e.g., changes in information condition (INFOCON), threat condition (THREATCON), defense condition (DEFCON), malicious threat, outages, etc.). Note: This effort completes in FY 2009, and does not transfer to PE 0603788F.</p> <p>In FY 2008: Designed and developed an enterprise management system with the capability to translate narrative policy into machine-readable code in order to reconfigure the network in response to strategic, tactical, and network threats.</p> <p>In FY 2009: Develop and demonstrate reconfiguration of network based-policy in response to strategic, tactical, and network events (e.g., changes in information condition (INFOCON), threat condition (THREATCON), defense condition (DEFCON), malicious threat, outages, etc.).</p> <p>In FY 2010: Not Applicable.</p> <p>In FY 2011: Not Applicable.</p>	0.735	1.034	0.000	
MAJOR THRUST: Develop and demonstrate offensive cyber operations capabilities in a series of experimental cyber craft technology demonstrations. These demonstrations will integrate capabilities developed from	1.338	2.130	0.000	

**UNCLASSIFIED**

R-1 Line Item #32

Page 8 of 19



**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)		<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development		<b>PROJECT NUMBER</b> 634216	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<p>ongoing offensive cyber programs in the areas of gaining access to systems, performing operations in a stealthy manner, gathering intelligence from the compromised systems, and launching cyber "effects" against the systems. Note: This effort transitioned in FY 2008 from Applied Research PE 0602702F, Project 4519, into this PE.</p> <p>In FY 2008: Initiated development of offensive cyber capabilities to access, remain stealthy, gather intelligence, and affect adversary information and information systems. Developed technology demonstration plans for cyber operations.</p> <p>In FY 2009: Analyze development of selected offensive cyber operations capabilities, integrated kinetic and cyber operations planning and execution capabilities, and cyber command and control (Cyber C2) operations functions.</p> <p>In FY 2010: Not Applicable.</p> <p>In FY 2011: Not Applicable.</p>					
<p><b>MAJOR THRUST/CONGRESSIONAL ADD:</b> Develop and demonstrate intelligent networking transport and management technology to provide assured, seamless, battlespace connectivity to the Air Force with a greatly reduced footprint. Note: This effort includes \$3.9 million in FY 2008 and \$3.9 million in FY 2009 Congressional add funding.</p> <p>In FY 2008: Developed improvements in the battle management command, control and communications networked collaborative capability by demonstrating Air Force airborne networking, in a coalition and multi-service environment, enabling aircraft to access each other's ISR airborne and ground information environments. Initiated the development of advanced, automated, network and bandwidth management technologies to move, manage, and process information in real-time to provide dynamic Quality of Assurance/ Quality of Service for the warfighter. Initiated investigation to provide assured access (anti-jam) covert high capacity spectrum dominance for global networking, while denying the adversary the same. Conducted</p>			7.093	6.578	0.000

**UNCLASSIFIED**

R-1 Line Item #32

Page 9 of 19

**UNCLASSIFIED**

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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>		<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<p>Congressionally directed effort for Massively Parallel Optical Interconnects for Battlespace Information Exchange to expand the number of wavelengths by utilizing FY2007 developments in flip-chip mounting of different lasers to a common dielectric silicon optical bench (SiOB). This represents a significant breakthrough in optoelectronic device technology.</p> <p>In FY 2009: Complete improvements in the battle management command, control, and communications networked collaborative capability by demonstrating Air Force airborne networking, in a coalition and multi-service environment, enabling aircraft to access each other's intelligence, surveillance, and reconnaissance airborne and ground information environments. Continue investigation to provide assured access (anti-jam) covert high capacity spectrum dominance for global networking, while denying the adversary the same. Conduct Congressionally directed effort for Massively Parallel Optical Interconnects for Battlespace Information Exchange.</p> <p>In FY 2010: Not Applicable.</p> <p>In FY 2011: Not Applicable.</p>				

**UNCLASSIFIED**

R-1 Line Item #32

Page 10 of 19

**UNCLASSIFIED**

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<p><b><u>C. Other Program Funding Summary (\$ in Millions)</u></b></p> <table style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:15%;"></th> <th style="width:10%; text-align: center;"><u>FY 2008</u></th> <th style="width:10%; text-align: center;"><u>FY 2009</u></th> <th style="width:10%; text-align: center;"><u>FY 2010</u></th> <th style="width:10%; text-align: center;"><u>FY 2011</u></th> <th style="width:10%; text-align: center;"><u>FY 2012</u></th> <th style="width:10%; text-align: center;"><u>FY 2013</u></th> <th style="width:10%; text-align: center;"><u>FY 2014</u></th> <th style="width:10%; text-align: center;"><u>FY 2015</u></th> <th style="width:10%; text-align: center;"><u>Cost To Complete</u></th> <th style="width:10%; text-align: center;"><u>Total Cost</u></th> </tr> </thead> <tbody> <tr> <td>Activity Not Provided/ Related Activities:</td> <td align="center">0.000</td> <td align="center">0.000</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">Continuing</td> <td align="center">Continuing</td> </tr> <tr> <td>PE 0602702F/ Command, Control, and Communications.</td> <td align="center">0.000</td> <td align="center">0.000</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">Continuing</td> <td align="center">Continuing</td> </tr> <tr> <td>Activity Not Provided/ This project has been coordinated through the Reliance 21 process to harmonize efforts and eliminate</td> <td align="center">0.000</td> <td align="center">0.000</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td align="center">Continuing</td> <td align="center">Continuing</td> </tr> </tbody> </table> <p><b><u>D. Acquisition Strategy</u></b> Not Applicable.</p> <p><b><u>E. Performance Metrics</u></b> Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.</p>											<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To Complete</u>	<u>Total Cost</u>	Activity Not Provided/ Related Activities:	0.000	0.000							Continuing	Continuing	PE 0602702F/ Command, Control, and Communications.	0.000	0.000							Continuing	Continuing	Activity Not Provided/ This project has been coordinated through the Reliance 21 process to harmonize efforts and eliminate	0.000	0.000							Continuing	Continuing
	<u>FY 2008</u>	<u>FY 2009</u>	<u>FY 2010</u>	<u>FY 2011</u>	<u>FY 2012</u>	<u>FY 2013</u>	<u>FY 2014</u>	<u>FY 2015</u>	<u>Cost To Complete</u>	<u>Total Cost</u>																																											
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**UNCLASSIFIED**

R-1 Line Item #32

Page 11 of 19

**UNCLASSIFIED**

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<b>COST (\$ in Millions)</b>	<b>FY 2008 Actual</b>	<b>FY 2009 Estimate</b>	<b>FY 2010 Estimate</b>	<b>FY 2011 Estimate</b>	<b>FY 2012 Estimate</b>	<b>FY 2013 Estimate</b>	<b>FY 2014 Estimate</b>	<b>FY 2015 Estimate</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
634872: Aerospace Information Dominance	14.533	10.996	0.000						Continuing	Continuing

**Note**

Note: In FY 2010 efforts moves to PE 0603788F, Project 5321, Global Battlespace Awareness, Project 5322, Knowledge Management and Computing, and Project 5319, Anticipatory Ops Intent and Response.

**A. Mission Description and Budget Item Justification**

In order to achieve information dominance, the Air Force must be able to plan, assess, monitor, and replan missions rapidly across the full spectrum of operations (air, space, and cyberspace) at all levels of war (strategic, operational, and tactical) and during all phases of conflict (pre-conflict, conflict, and stability operations). This project develops and demonstrates technologies necessary for dynamic decision making. It provides the technology and demonstrations needed to enable the warfighter to monitor, assess, plan, and execute (MAPE) on the complex and compressed time scales required for tomorrow's conflicts, whether they are combat or operations other than war. It will develop and demonstrate a new generation of planning and assessment technologies that enable a new paradigm of network enabled operations, allowing decision makers to determine the desired operational effects and prosecute the mission accordingly. This project will develop innovative capabilities that will realize a strategy-to-task approach to warfare, exploiting anticipatory environments and agile command and control concepts. It will develop and demonstrate distributed information technologies that provide the decision maker and staff with seamless access to tailored multi-media, multi-spectral data, within a mobile, dynamic, scalable, globally distributed Air and Space Operations Center (AOC). This project will also develop knowledge-based intelligent information technologies to support robust, real-time, large-scale Air Force command and control systems.

**B. Accomplishments/Planned Program (\$ in Millions)**

	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
(U) MAJOR THRUST: Develop and demonstrate distributed information technologies that are scalable and reconfigurable and provide seamless access to tailored multi-media, multi-spectral data for decision makers and staff in mobile, dynamic, scalable, globally distributed command and control centers. Note: In FY 2010 this effort moves to PE 0603788, Project 5319, Anticipatory Ops Intent and Response.	3.971	1.516	0.000	
(U) In FY 2008: Completed development of capabilities that allow a networked enabled operations center to plan, direct, coordinate air force assets across security boundaries in a coalition environment. Developed and demonstrated the capability to accomplish dynamic air space management and de-confliction of manned and unmanned aircraft focused on air control measure parsing, timely conflict identification, advanced				

**UNCLASSIFIED**

R-1 Line Item #32

Page 12 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009		
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<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<p>visualization, and seamless collaboration. Developed a campaign of experimentation to quantitatively measure transformational command and control concepts enabled by net centric warfare capabilities. Demonstrated command and control decision-support capabilities. Developed the capability to normalize the use of information operations with precision munitions to achieve desired effects against our adversaries within the air, space, and cyberspace domains. Completed development of peer-to-peer and publish/subscribe/query information distribution systems and adaptive embedded computing techniques operating within a persistent surveillance system for very high resolution, wide-area, and global positioning system-coded surveillance images. Developed polymorphic (adaptable) computing technology for persistent surveillance systems using faster processing and greatly reduced size, weight, and power requirements for processing hardware. Developed and applied Multi-Level Security/Multiple Single Levels of Security (MLS/MSLS) middleware technologies for persistent surveillance systems to support user access/denial of information at multiple security levels.</p> <p>In FY 2009: Initiate the development of capabilities to allow seamless information sharing for enhanced situational awareness and understanding by the decision maker. Continue the development of an initial capability to plan and measure effectiveness of information operations in conjunction with precision munitions to determine successful achievement of command intent in time and location to achieve "self-synchronization." Continue campaign of experimentation to quantitatively measure transformational command and control concepts enabled by net centric warfare capabilities. Complete the development of polymorphic (adaptable) computing technology for persistent surveillance systems using faster processing and greatly reduced size, weight, and power requirements for processing hardware. Continue the development and application of MLS/MSLS middleware technologies for persistent surveillance systems to support user access/denial of information at multiple security levels.</p> <p>In FY 2010: Not Applicable.</p>					
(U) MAJOR THRUST: Develop and demonstrate the integration of planning tools and information-based intelligent agents for adaptive preplanning and decision support tools for Air Force command and control			1.204	0.690	0.000

**UNCLASSIFIED**

R-1 Line Item #32

Page 13 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)		<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development		<b>PROJECT NUMBER</b> 634872	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<p>systems. Note: In FY 2010, this effort moves to PE 0603788F, Project 5319, Anticipatory Ops Intent and Response.</p> <p>In FY 2008: Completed development of improved synchronization among Global Strike and Global Mobility Force participants within multiple theaters and global Civil air traffic management (ATM). Completed automated machine-to-machine exchange of selected information capabilities between CAF aircraft, MAF aircraft, and their respective command and control elements. Completed multi-mission optimization capability by exploiting information discovery and delivery, advanced, multi-constraint and distributed optimization techniques, and evaluation models to support mobility operations with special emphasis on increased efficiency and decreased routine workload across functional and supervisory positions. Demonstrated capability for cross-functional collaboration that will increase situation awareness and understanding during mission planning and execution to allow the planning and execution teams to self-synchronize, ensuring a highly coordinated effort. Completed development of next generation tools and technologies to revolutionize air mobility information dominance to respond swiftly to global demands across all spectrums of operations from humanitarian relief to a major conflict.</p> <p>In FY 2009: Initiate development of capabilities to be more agile within a net centric enabled environment. Develop timely option generation selection and coordination capabilities that account for uncertainty and missing and erroneous information, and supports intuitive decision making process between man and machine collaborating on complex, dynamic problems exploiting the respective strengths of machines (process lots of data) and human (analytical reasoning). Develop dynamic workflow and workload management capabilities to manage the command and control constellation of resources.</p> <p>In FY 2010: Not Applicable.</p>					
<p>MAJOR THRUST: Develop and demonstrate an effects-based approach for the next generation of planning and assessment techniques that enable decision makers to determine the desired operational effects (nth-order) at the right place at the right time, anywhere, anytime. Note: In FY 2010, this effort moves to PE</p>			3.431	3.290	0.000

**UNCLASSIFIED**

R-1 Line Item #32

Page 14 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)		<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development		<b>PROJECT NUMBER</b> 634872	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<p>0603788F, Project 5319, Anticipatory Ops Intent and Response, except for the efforts in brackets in FY 2009, which move to Project 5321, Global Battlespace Awareness.</p> <p>In FY 2008: Demonstrated concepts and technologies supporting effects-based planning, execution, and assessment by enabling the generation, tasking, and assessment of effects-based tasking. Demonstrated technologies to allow operations center personnel to assess, in near-real-time, various courses of action (COA) options based upon command intent. Developed technologies to capture and assess integrated cause-and-effect (first, second, and third order) relationships endemic to this "enemy as a system." Completed the operational concept and architecture for effects based assessment to drive software development and experimentation to determine the ability of developed capabilities to assist warfighters in conducting accurate and timely assessments. Completed the development of techniques to continually assess status of planned actions against adversary systems to determine whether predicted effects are actually achieved. Initiated an analysis of cascading effects in real-time for diverse courses of action. Initiated research to forecast actionable futures to support a decision maker's ability to appraise and plan the "best" blue course of action for Rapid, Decide, Act and Adapt (RDAA). Initiated investigation of ability to forecast potential adversaries and events based on indications of known evidence and projected known and/or anticipated threat(s).</p> <p>In FY 2009: Demonstrate technology to meet the needs for effects-based assessment in an operational environment. Design, develop, and demonstrate the capabilities for continuous effects-based assessment in a dynamic tasking environment. Demonstrate techniques to accomplish up-to-date awareness on whether the execution of the battle plan is meeting the desired effects. Investigate the methods to enable a decision support environment that enables the decision maker to anticipate and shape all aspects of the future battlespace. Initiate development of predictive battlespace awareness tools with the ability to reason over models of the "enemy as a system." Continue analysis of cascading effects in real-time for diverse courses of action. [Continue research to forecast actionable futures to support a decision maker's ability to appraise and plan the "best" blue course of action for RDAA. Continue investigation of ability to forecast potential adversaries and events based on indications of known evidence and projected known and/or anticipated threat(s).] Initiate assured end-to-end Quality of Service and Quality of Assurance integration to the information system enterprise during malicious and non-malicious faults.</p> <p>In FY 2010: Not Applicable.</p>					

**UNCLASSIFIED**

R-1 Line Item #32

Page 15 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009	
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)	<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development		<b>PROJECT NUMBER</b> 634872	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<p>MAJOR THRUST: Develop and demonstrate high performance computing for size, weight, and power-limited applications, and emulate older computing components. Note: In FY 2010, this effort moves to PE 0603788F, Project 5322, Knowledge Management and Computing.</p> <p>In FY 2008: Developed high performance computing for size, weight, and power-limited applications. Transitioned power efficient processors to DoD users by addressing power, programmability, and radiation issues. Developed and demonstrated emulation of older computing components and boards, allowing re-use of existing software while gaining the advantages of modern semiconductor processing technology.</p> <p>In FY 2009: Complete development of high performance computing for size, weight, and power-limited applications. Support the resulting hardware and software transition to the users. Initiate development of reliably autonomic small platforms for unmanned operations. Initiate analysis of hardware and system/support software that enables complex software to be readily composed.</p> <p>In FY 2010: Not Applicable.</p>	1.303	1.078	0.000	
<p>(U) MAJOR THRUST: Demonstrate how a publish, subscribe, and query information management paradigm can enable vertical and horizontal integration of Air Force command, control, communication, computers, intelligence, surveillance, and reconnaissance information systems. Develop advanced prototypes of a Community Of Interest (COI) infosphere that support information management requirements of various Air Force net-centric COI's. Demonstrate how such an infosphere can interact with and enhance the current net-centric operations infrastructure. Note: In FY 2010, this effort moves to PE 0603788F, Project 5322, Knowledge Management and Computing.</p> <p>In FY 2008: Developed tactical and federated COI infospheres to manage information objects from diverse sources and data environments within and across the tactical edge. Applied adaptor technology to allow existing Air Force systems to rapidly integrate with and utilize COI information sources, with a special</p>	2.824	4.422	0.000	

**UNCLASSIFIED**

R-1 Line Item #32

Page 16 of 19



**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009	
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)	<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development		<b>PROJECT NUMBER</b> 634872	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
<p>emphasis on distributed and decentralized information brokering technology to enhance systems integration of information sources across the global information enterprise adapting to infrastructure and topology constraints. Completed information engineering efforts focusing on Unit Command and Control (Unit C2) and the Installation Control Center (ICC) goals of providing unit decision makers with an integrated, standardized enterprise capability to control and manage resources to execute assigned missions; providing the ability to collaborate and synchronize Unit enterprise activities with the Warfighting Headquarters; and sharing information real time in the accomplishment of normal day-to-day operations or in generating aircraft to support the wartime Air Tasking Order (ATO). Initiated the development of technologies that enable a generic methodology for the dissemination of information across multiple security level boundaries. Developed capability integrating tactical and edge user information management requirements. Initiated development of information transformation services and adaptive information management services that learn, self-configure, self-manage, and are self-healing. Initiated a study on collaboration services on demand that will exploit dynamic information services matching end user devices (laptops, cell phones, etc.) with appropriate information formats. Developed COI Infospheres in the areas of context aware collaborative user interfaces and semantic interoperability.</p> <p>In FY 2009: Develop and demonstrate technologies that enable pub/sub/query information dissemination across multiple security level boundaries. Initiate the study of discovery and filter technology to assess, evaluate, and convert unstructured information into structured information feeds. Demonstrate capability integrating tactical and edge user information management requirements. Continue development of information transformation services and adaptive information management services that learn, self-configure, self-manage, and are self-healing. Continue study on collaboration services on demand that will exploit dynamic information services matching end user devices (laptops, cell phones, etc.) with appropriate information formats. Continue to support context aware collaborative user interfaces and semantic interoperability.</p> <p>In FY 2010: Not Applicable.</p>				
CONGRESSIONAL ADD: Collaboration Gateway.	1.000	0.000	0.000	

**UNCLASSIFIED**

R-1 Line Item #32

Page 17 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>			<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)		<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development		<b>PROJECT NUMBER</b> 634872	
<b>B. Accomplishments/Planned Program (\$ in Millions)</b>			<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>
<p>In FY 2008: Conducted Congressionally directed effort for Collaboration Gateway to develop the capabilities of the Collaboration Gateway Architecture to support cross-domain audio conferencing, white-boarding, interoperability of commercial collaboration tools, and enhanced federated information search &amp; retrieval capabilities..</p> <p>In FY 2009: Not Applicable.</p> <p>In FY 2010: Not Applicable.</p>					
<p>CONGRESSIONAL ADD: Interoperability Network to Fuse and Exchange Real-Time Information.</p> <p>In FY 2008: Conducted Congressionally directed effort for Interoperability Network to Fuse and Exchange Real-Time Information to demonstrate a threat agent network capable of providing chemical detection, intrusion detection, physical security, surveillance, command and control, wireless connectivity between the screening and environmental monitoring sites and to the command center and other existing technology at Liberty Island National Monument using the AFRL Integrated Information Management System (IIMS).</p> <p>In FY 2009: Not Applicable.</p> <p>In FY 2010: Not Applicable.</p>			0.800	0.000	0.000

**UNCLASSIFIED**

R-1 Line Item #32

Page 18 of 19

**UNCLASSIFIED**

<b>Exhibit R-2a, PB 2010 Air Force RDT&amp;E Project Justification</b>								<b>DATE:</b> May 2009		
<b>APPROPRIATION/BUDGET ACTIVITY</b> 3600 - Research, Development, Test & Evaluation, Air Force/BA 3 - Advanced Technology Development (ATD)			<b>R-1 ITEM NOMENCLATURE</b> PE 0603789F C3I Advanced Development					<b>PROJECT NUMBER</b> 634872		
<b><u>C. Other Program Funding Summary (\$ in Millions)</u></b>										
	<b><u>FY 2008</u></b>	<b><u>FY 2009</u></b>	<b><u>FY 2010</u></b>	<b><u>FY 2011</u></b>	<b><u>FY 2012</u></b>	<b><u>FY 2013</u></b>	<b><u>FY 2014</u></b>	<b><u>FY 2015</u></b>	<b><u>Cost To Complete</u></b>	<b><u>Total Cost</u></b>
Activity Not Provided/ Related Activities:	0.000	0.000							Continuing	Continuing
PE 0602702F/ Command, Control, and Communications.	0.000	0.000							Continuing	Continuing
Activity Not Provided/ This project has been coordinated through the Reliance 21 process to harmonize efforts and eliminate	0.000	0.000							Continuing	Continuing
<b><u>D. Acquisition Strategy</u></b> Not Applicable.										
<b><u>E. Performance Metrics</u></b> Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.										

**UNCLASSIFIED**

R-1 Line Item #32

Page 19 of 19

UNCLASSIFIED

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